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Cheyletiella mexicana sp. nov. (Acarina, Cheyletiellidae)
parasitic on *Romerolagus diazi* (Mammalia, Leporidae)

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Abstract : *Cheyletiella mexicana* sp. nov. was described and illustrated on the female, male deutonymph and protonymph as a parasite of the volcano rabbit, *Romerolagus diazi*. The rabbit also yielded the other mite of the same genus, *Ch. parasitivorax* (Mégnin).

INTRODUCTION

The three relic rabbits relegated to the subfamily Palaeolaginae are distributed far apart from one another in Japan, Mexico and southern Africa. It is reasonable to presume on so far accumulated parasitological informations that these rabbits harbour many allied parasites or even share some, and that some parasites shed light on the phylogenetic relations among the three rabbits or among these three and other rabbits.

The junior author has elucidated the acarine fauna of *Pentalagus furnessi*, the Japanese relic rabbit called Amami-rabbit, and proceeds, with his colleagues, to have a phylogenetic study of the rabbits of the subfamily Palaeolaginae partly adopting parasites as indicators. They examined *Romerolagus diazi*, the volcano rabbit, in Mexico, and collected many ecto- and endo-parasites (Kamiya, 1978). The present paper is concerned exclusively with the mites of the genus *Cheyletiella* Canestrini among a vast number of parasitic mites collected by the hanging method.

The mites examined amounted to 129 examples consisting of 50 females, 44 males, 20 deutonymphs and 15 protonymphs. It is very interesting and curious that the distinctly different 2 forms were observed only in the female. One form predominated over the other that was merely represented by the 3 specimens. The morphological difference between both the forms was so distinctive that the latter was not likely a variant of the former. As compared with the morphological accounts in Smiley (1970) and Rack (1971), the form with least

examples was identified as *Cheyletiella parasitivorax* (Mègnin), and the predominant from as a new species as described below. The males and immature stages were regarded as those of the new species.

Cheyletiella mexicana sp. nov.

Female (Fig. 1). Palp not so strong ; femur dorsally with a feathered, strong seta and ventrally with one each of feathered and simple setae ; genu with one each of feathered dorsal and ventral setae ; tibia with 3 simple setae and a strong claw ; tarsus with 4 setae, inclusive of a forked one.

Idiosoma with 2 dorsal shields. Propodosomal shield large, with many punctures and indistinct reticulations, bearing 2 pairs of feathered antero-lateral setae (*Al*) and 2 pairs of long, simple posterior setae (*Pi*, *Pe*). First pair of antero-lateral setae close to, but off the shield. Two pairs of scapular setae (*Sc i*, *Sc e*) feathered and strong. A transverse row of minute sclerites on demarcation between propodosoma and hysterosoma. Hysterosomal shield very much wider than long, finely punctuated laterally. Three transverse rows of setae dorsally on hysterosoma ; a pair each of simple and feathered setae on first row (*Ha i*, *Ha e*) situated slightly anteriad from the shield ; 2 pairs of setae on second row (*Hm i*, *Hm e*) simple ; 3 pairs of setae on third row (*Hp*) simple and minute. A pair of subterminal setae (*St*) close to exteriormost setae of *Hp* well developed and simple. Three pairs of genital setae present caudally. Several pairs of minute sclerites dorsally on hysterosoma.

Three pairs of intercoxal setae and 3 pairs of hysterosomal setae arranged as in Fig, 1B. Two pairs of genital setae on vulval valves. All these setae as well as coxal setae simple. Minute sclerites distributed as in Fig, 1B.

All legs rather short. Solenidium on genu I circular. Dorsal setae on segments distal to genu simple or very weakly feathered. Setae on trochanters and femora and ventrally on other distal segments usually feathered strongly.

Measurements in microns (for holotype followed by ranges for 5 specimens in parentheses) : Body (gnathosoma, exclusive of palp + idiosoma) 450(435-460) long and 270(255-280) wide ; propodosomal shield 105(95-110) long by 210(200-215) wide ; *Al*₁ 25(25-30) ; *Al*₂ 45(35-45) ; *Al*₃ 50 (40-50) ; *Pi* 60(60-70) ; *Pe* 70(65-70) ; *Sc i* 110(75-95) ; *Sc e* 105 (55-85) ; hysterosomal shield 30(30-45) long by 140(135-165) wide ; *Ha i* 100(85-100) ; *Ha e* 100(85-100) ; *Hm i* 20(15-18) ; *Hm e* 25(20-25) ; *St* 225(190-220).

Male (Fig. 2). Palp well developed. Setation of palp as in female, but dorsal seta on genu simple or very weakly serrate and tarsus with only 4 simple setae and a protuberance.

Idiosoma with 2 large dorsal shields. Propodosomal shield with smaller number of punctures and foveal structures. Cell-like very minute sclerites embedded antero-laterally on propodosoma. Setation and nature of setae on propodosoma as in female.

Hysterosomal shield with markings on anterior and antero-lateral parts, bearing a pair of very strong, simple setae anteriorly and 2 pairs of minute, simple setae postero-laterally. Hysterosomal antero-external and subterminal setae strong and feathered. Three pairs of minute setae and 2 pairs of genital setae present posterior to hysterosomal shield. Penis stout and

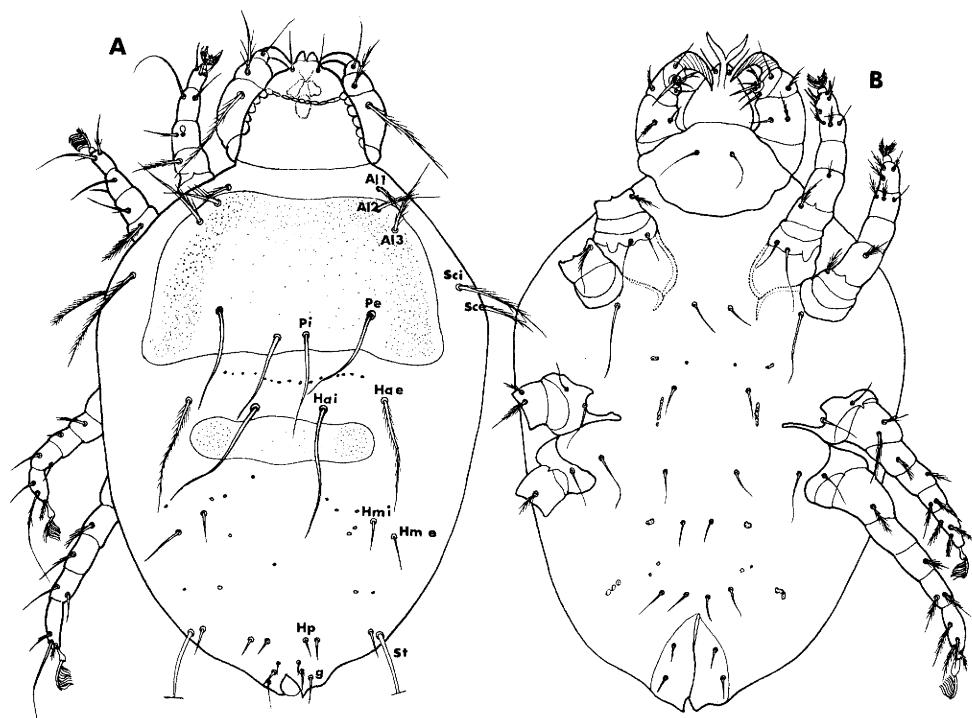


Fig. 1. *Cheyletiella mexicana* sp. nov., female. A—dorsum, B—venter.

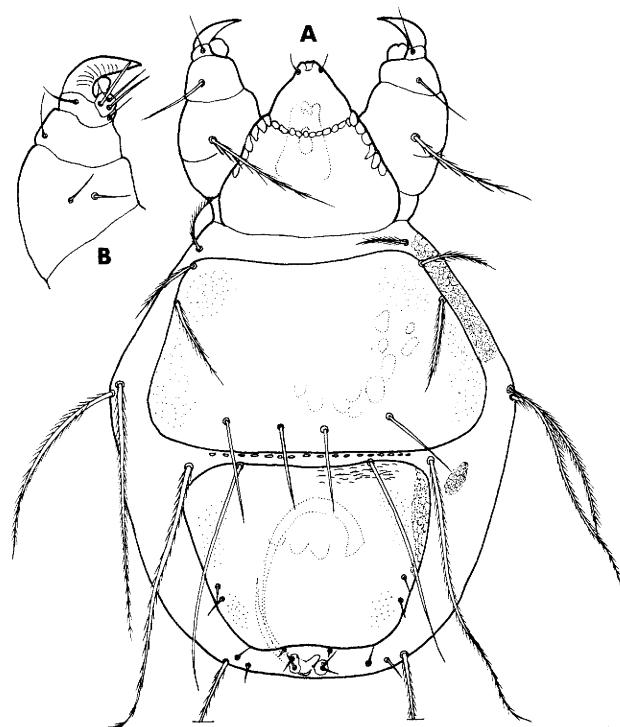


Fig. 2. *Cheyletiella mexicana* sp. nov., male. A—dorsum, B—ventral view of palp.

curved proximally.

Ventral structure and setation almost as in female, but only 2 pairs of setae posterior to intercoxal setae.

All legs, leg setation, leg setal nature and solenidium on genu I essentially as in female.

Measurements in microns (for allotype followed by ranges for 5 specimens in parentheses) : Body 310 (290–330) long and 195 (195–235) ; propodosomal shield 103 (78–100) long by 158(158–200) wide ; Al_1 28(23–25) ; Al_2 35(35–38) ; Al_3 46(45–48) ; Pi 42(40–45) ; Pe 40(41–49) ; $Sc\ i$ 98(93–150) ; $Sc\ e$ 75(75–105) ; hysterosomal shield 95(83–98) long by 108 (103–133) wide ; $Ha\ i$ 90 (85–115) ; $Ha\ e$ 113(120–160) ; 2 pairs of Hm subequal, 15–17(13–18) ; St 165(150–173).

Deutonymph (Fig. 3A). Gnathosoma, inclusive of setation of palp, almost as in female. Propodosoma essentially as in female, but setae Al_1 on propodosomal shield that is reticulated distinctly. Hysterosoma lacking shield. Setae $Hm\ e$ and St strong and feathered. Only 2 pairs of minute setae close to caudal margin. Venter of idiosoma as in male. Four pairs of setae surrounding anus, and a pair of minute setae posterior to anus. Solenidium of genu I variable ; distal margin rather flat on some specimens.

Measurements in microns (ranges for 5 specimens) : Body 300–380 long by 230–300 wide ; propodosomal shield 78–87 long by 180–185 wide ; Al_1 18–20 ; Al_2 38–40 ; Al_3 45–53 ; Pi 36–43 ; Pe 48–58 ; $Sc\ i$ 83–90 ; $Sc\ e$ 70–78 ; $Ha\ i$ 30–63 ; $Ha\ e$ 98–105 ; $Hm\ e$ 93–

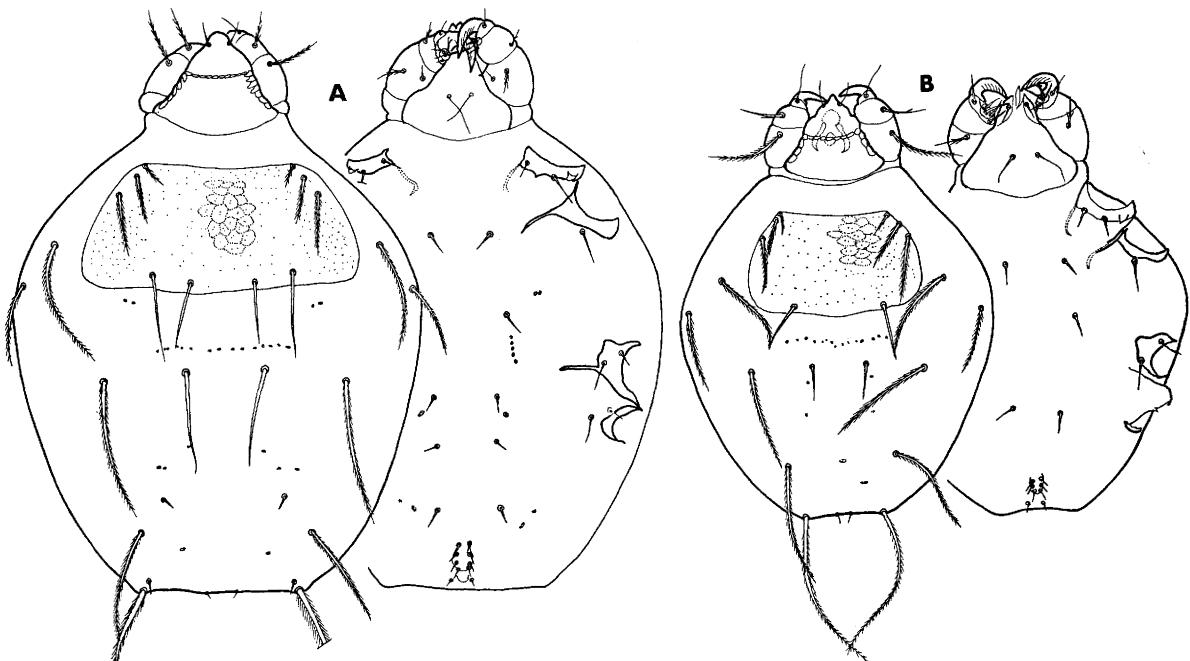


Fig. 3. *Cheyletiella mexicana* sp. nov., deutonymph and protonymph (in the same scale). A—dorsum and venter of deutonymph, B—dorsum and venter of protonymph.

102 ; *St* 138–148.

Protonymph (Fig. 3B). Gnathosomal structure essentially as in deutonymph, but ventral seta on palpal genu lacking. Hysterosoma with 3 pairs of strong, feathered setae, a pair of hysterosomal antero-internal setae and a minute caudal marginal setae. Three pairs of prominent setae, 3 pairs of anal setae and a pair of minute setae present ventrally on idiosoma. Coxa IV lacking setae. Solenidium on genu I variable as in deutonymph.

Measurements in microns (ranges for 5 specimens) : Body 265–300 long by 188–200 wide ; propodosomal shield 60–70 long by 115–133 wide ; *Al₁* 13–18 ; *Al₂* 28–38 ; *Al₃* 33–45 ; *Pe* 35–37 ; *Sc i* 50–63 ; *Sc e* 43–50 ; *Ha i* 19–40 ; *Ha e* 60–70 ; *Hm e* 70–80 ; *St* 95–108.

Material examined. The holotype female, 5 paratype females, 20 females, allotype male, 5 paratype males, 29 males, 13 deutonymphs and 14 protonymphs ex *Romerolagus diazi*, Parres, Mexico, October 12, 1977 ; 21 females, 9 males, 7 deutonymphs and 1 protonymph from 2 individuals of the same host, Cicitec, Mexico, October 9, 1977. The 3 specimens of female *Cheyletiella parasitivorax* were taken together with the former examples.

The holotype and allotype are deposited in the collection of the National Science Museum, Tokyo (NSMT-Ac 9288~9289), 2 pairs of the male and female paratypes in the collection of the junior author and the other specimens in the collection of the senior author.

DISCUSSION

The mammalian order Lagomorpha are associated with parasites of the two genera of the family Cheyletiellidae, *Eucheyletiella* Volgin and *Cheyletiella* Canestrini. These two mite genera share an important characteristic among the genera of the family Cheyletiellidae, that is, they are sole members that lack claws and bear only a well-developed, rayed empodium each on the tarsi I–IV. These two genera are exclusive representatives of Smiley's subfamily Cheyletiellinae (Smiley, 1978), and are so closely allied that *Eucheyletiella* was separated from *Cheyletiella* only recently (Smiley, 1970). The host specificity of both the genera is, however, strict. *Eucheyletiella* mites are exclusively parasitic on Ochotonidae or pikas, and *Cheyletiella* mites on Leporidae or rabbits and hares and on their predaceous carnivores, the dog, cat and foxes.

The mites of the genus *Cheyletiella* so far comprise 7 species, inclusive of the present new species. The 4 species are parasites of rabbits and hares of the subfamily Leporinae, and the 2 other species parasitize the dog and cat (Smiley, 1971 ; Fain, 1972). The present new species is the first mite of the genus found on the rabbit of the subfamily Paraeolaginae. The female mite is remarkably different from those of all the known species in having a hysterosomal shield and short, simple hysterosomal setae *Hm e*. As far as the female is concerned, *Ch. mexicana* sp. nov. apparently resembles *Ch. yasugri* Smiley infesting commonly the dog in having the hysterosomal shield. It may here be mentioned incidentally that any hysterosomal shield of the female is aberrant for the mites of Smiley's Cheyletiellinae (Smiley, 1970, 1978). As the immature stages of *Ch. mexicana* sp. nov. and *Ch. yasugri* differ

considerably from each other, it is recommended that the morphological similarity among the known mites should be interpreted on all the developmental stages.

We should pay attention to the concomitant occurrence of *Ch. mexicana* sp. nov. and *Ch. parasitivorax* on a single host rabbit. It is not uncommon that two or more species of parasitic mites of a genus occur on a single host animal. The present paper is, however, probably the first to offer the case in the genus *Cheyletiella*. Some mites taken together with the present material were delivered to a Mexican acarologist. Then, exact composition of the two mites on the host was not clear. It is, however, reasonable to deem on the material at hand that *Ch. mexicana* sp. nov. predominated over *Ch. parasitivorax*. Although the ecology of both the mites on the volcano rabbit is not yet clarified, the present authors are of opinion that *Ch. mexicana* sp. nov. is a specific parasite of the rabbit, and that *Ch. parasitivorax* was accidentally transferred from its natural host. Rak (1971) showed that the egg of *Ch. yasguri* Smiley was laid attached to hair with thread, and that, thus, all the developmental stages were on the host. Any permanent ectoparasite such the above is reluctant to transfer from own host to other kinds of hosts. Vercammen-Grandjean and Rak (1968) demonstrated the female of *Ch. yasguri* phoretic on the louse-fly, *Hippobosca longipennis*, in Iran. It is not impossible for *Cheyletiella* mites to transfer to strange hosts by phoresy or other ways. The authors spot the cottontail, *Sylvilagus* sp., sharing the habitat with the volcano rabbit (Kamiya, 1978) as a natural host of *Ch. parasitivorax*.

As described above, *Ch. mexicana* sp. nov. is a mite with remarkable properties so far specific to the rabbit of the subfamily Palaeolaginae. From this finding, it is surely expected that some mites closely allied to or identical with the new species, and provided with informations on phylogenetic relations among their hosts occur on the other two rabbits of the subfamily.

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メキシコウサギに寄生するツメダニの1新種 *Cheyletiella mexicana*

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メキシコウサギから *Cheyletiella* 属のダニ 2 種を採集した。1 種は新種であり, *Cheyletiella mexicana* sp. nov. と命名した。本種の発見から, ムカシウサギ亜科に含まれるアマミノクロウサギおよび南アフリカ産アカウサギにも近縁のツメダニが寄生しているものと推察される。他のツメダニは, すでにウサギ亜科の寄生虫として広く知られている *Cheyletiella parasitivorax* (Mégnin) であったが, このダニはメキシコウサギに何等かの宿主から移行したものと思われる。

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